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CENTRAL INTELLIGENCE AGENCY

13 January 1963

MEMORANDUM FOR THE UNITED STATES INTELLIGENCE BOARD

25X1C8a

SUBJECT: U.S.-[redacted] ESTIMATE OF THE COMMUNIST CHINESE AIR THREAT AGAINST INDIA

25X1C8a

1. Attached is a memorandum entitled "U.S.-[redacted] ESTIMATE OF THE COMMUNIST CHINESE AIR THREAT AGAINST INDIA," which was the subject of discussion between US and [redacted] intelligence representatives in [redacted] on 10-11 January 1963.

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2. Appendix B to follow.

3. It is requested that your representatives meet with us at 1000, Tuesday, 15 January 1963, at CIA Headquarters to discuss this paper. Subject to the results of these discussions and since drafts of the paper have been previously discussed by USIB, it is proposed that clearance of the paper by USIB principals be obtained telephonically if possible, thereby eliminating the need for consideration at a USIB meeting.

25X1A9a

[redacted]

Acting Deputy Assistant Director
National Estimates

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CENTRAL INTELLIGENCE AGENCY

13 January 1963

25X1C8a

SUBJECT: U.S. [redacted] ESTIMATE OF THE COMMUNIST CHINESE AIR THREAT AGAINST INDIA

Object

1. The object of this study is to examine overall Chinese air capability and to assess its effectiveness in operations against India.

THE COMMUNIST CHINESE AIR FORCE

History

2. From a humble beginning in 1949 the Communist Chinese Air Force has developed rapidly into a significant force; indeed, in combat strength it is now the third largest Air Force in the world. Initially, and for a number of years, its expansion was made possible by the provision of technical advisers, instructors, and aircraft by the U.S.S.R. An impetus to development was given by the Korean War. An aircraft industry was built up with extensive aid from the Soviet Union and the manufacture of relatively modern

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Soviet types, such as MIG-17 (FRESCO) fighters was started in the late fifties.

Economic and Political Considerations

3. The development of the aircraft industry was part of a wide programme of forced industrial development, designed to transform China into a powerful self-sufficient industrialised nation in the shortest possible time. Initial progress was impressive but in 1958 the regime ordered the adoption of radical programmes which attempted to accelerate greatly the pace of production and development. At the same time they introduced the communes in the countryside. It is now clear that those policies failed, and aggravated by the bad weather conditions in the past three years, they have resulted in poor harvests and a severe setback to the economy as a whole. A serious food shortage caused a pronounced deterioration in the health, strength and morale of a significant part of the populace. A drastic reorganisation of economic priorities in 1961 has not resulted in heavy industry being placed after agriculture and light industry. A slight improvement in the food situation has been experienced in 1962 but there is no prospect of a substantial increase in industrial production in the foreseeable future.

4. The abrupt withdrawal in 1960 of most of the Soviet engineers, technicians and economic advisers, plus the sharp reduction in imports of Soviet equipment, have seriously reduced production in industries of defence importance. Unless this situation is remedied, China will be unable to build such equipment as modern aircraft (e.g. the MIG-21 (FISHBED) and TU-16 (BADGER)) in significant quantities for some years.

5. We believe that as a result of the discord in Sino-Soviet relations the Soviet Union has not supplied any modern offensive aircraft to China in the past two years, although she has been willing to make them available to other countries such as Iraq, Indonesia, and the U.A.R. We consider that as long as the serious rift in relations remains the Soviet Union will be reluctant to supply modern aircraft to China, and she will be faced with growing obsolescence in her Air Forces. Even in the unlikely event of her economic problems and ideological differences being resolved in the near future, it would be several years before China could significantly improve her air capability entirely from her own resources. If combat aircraft were directly supplied by the U.S.S.R. there would be, of course, a limited improvement in much shorter period.

Organisation of the Air Force

6. The Communist Chinese Air Force (C.C.A.F.), subordinate to the Ministry of Defence, is organised as a single entity encompassing all phases of air operations and has no operational commands. However, in most other respects it reflects Soviet concepts and principles. C.C.A.F. headquarters is located at Peking and consists of operational, logistic and training elements. The Communist Chinese Naval Air Force (C.C.N.A.F.) is an integral part of the Navy with its headquarters also at Peking.

7. The air defence system is controlled from Peking through at least seven district air defence headquarters, which are responsible for the co-ordination and control in their particular areas. During air defence operations naval fighter units are under the operational control of the C.C.A.F., through these district headquarters.

Strength and Deployment

8. The C.C.A.F. and C.C.N.A.F. have a combined strength of about 2,650 aircraft; the majority of which are jet fighters (1,950) deployed along the coastal periphery and adjacent to major inland centres. The IL-28 (BEAGLE) jet light bomber force (325), the

piston TU-2 (BAT) light bombers (105), the special ground attack aircraft (40 IL-10 (BEAST)*), and a few obsolescent TU-4 (BULL) medium piston-engined bombers (15) are deployed mainly in northern areas. In addition, we have firm evidence of two BADGERS which were probably delivered to the Chinese by the U.S.S.R. prior to mid-1960. What evidence we have suggests that these aircraft are flyable, but we cannot be certain whether they are operational. We estimate the strength of the air transport force to be approximately 195 piston-engined short-range aircraft, made up mainly of the IL-2 (CAB), the IL-12 (COACH) and the IL-14 (CRATE). (CAB is very similar to the Dakota or DC-3. COACH and CRATE resemble the Convair 240), A summary of aircraft strength is at Appendix A, aircraft performance details are given at Appendix B, and a map showing general deployment and radar cover is at Appendix C.

Airfields

9. There is a well-developed airfield system in China which includes a network of airfields stretching some 400 miles inland, providing a strong support for the coastal bases. Approximately

* In addition, a unit of 30 MIG-15 (FAGOTS) is specially trained in ground attack and, in fact, all FAGOT/FRESCO are readily adaptable to ground attack.

260 airfields are distributed throughout the country, including 135 which are suitable for jet fighters or jet light bombers, and 30 of which can be used for jet medium bombers. The airfield system also provides facilities for redeployment of aircraft (mobility is stressed in the C.C.A.F./C.C.N.A.F.) to any sector in eastern and coastal regions from North Korea to the Indo-China borders. The Chinese are capable of rapid airfield construction, as they have demonstrated when the need has arisen in the past.

10. Many Chinese airfields in the area adjacent to the Indian border are at high altitudes (two are at an altitude of above 10,000 ft a.m.s.l.) and have natural or gravel surfaces rendering them generally unsuitable for sustained jet operations. However, the Chinese do possess airfields in the area which are not at high altitudes and which could be used for light bomber or fighter action against India. The airfields most likely to be used for operations against the Ladakh - Jammu - Kashmir area, are Hotien (Khotan) at 3,000 ft. elevation and Soche (Yarkand) at 4,400 ft. elevation. Details of airfields in Tibet and Western China are given at Appendix "D"; their location is shown on the map at Appendix "C".

11. High elevation and natural runway surfaces alone would not prevent the Chinese from conducting militarily significant jet

operations. However, they would pose serious limitations, particularly for sustained operations. Reductions in radius of action and/or bomb load would be necessary for jet bomber operations from some airfields in the Himalayan area. For example, at Lhasa, at 14,000 feet elevation and a temperature of 0° Centigrade, we believe that a BEAGLE at a reduced all-up weight would require 10,750 feet of the available 13,000 feet runway to become airborne.*

General Capabilities

12. Although the C.C.A.F./C.C.N.A.F. is numerically large, its capabilities are seriously limited in several important aspects. First, it lacks balance in that it is basically a defensive force (three-fourths of its aircraft are fighters) and it has a very limited bombardment capability. Secondly, inadequacy of native production and cessation of Soviet assistance has created a marked obsolescence in equipment. Thirdly, the Chinese air force lacks practically all types of advanced weapons. For example, we do not believe they are equipped with air-to-air missiles.

* See Table 5 of Appendix B for required take-off and landing distances for BEAGLE at various altitudes, weights and temperatures.

13. The Chinese do not have a nuclear weapons capability. We believe that nuclear progress was considerably set back by the withdrawal of Soviet technicians in mid-1960. Resumption of Soviet assistance or Soviet supply seems most unlikely in the light of the present tension in Sino-Soviet relations. Therefore, we estimate that the Chinese will not acquire a militarily significant nuclear capability in the next few years.

14. Communist Chinese airmen have demonstrated neither the techniques nor level of proficiency in air combat which would permit them to conduct successful offensive tactical operations against first-line opposition. Although they have probably taken measures to improve combat capability since their encounter with the Chinese Nationalists in 1958, P.O.L. shortages have sharply limited training time in the air.

Offensive Capability

15. The C.C.A.F. jet light bomber force has had no known operational experience, but has been carrying out training for several years in the bombing role. It probably has a limited radar bombing and E.C.M. capability, and we estimate that it has the ability to mount reasonably effective operations. A piston-engined light

bomber force is still retained but its effectiveness in the face of modern opposition would be very low.

16. The medium bomber force, consisting of 15 BULLs and possibly 2 BADGERs, possesses a very limited strategic bombing capability due to its small size. The BULL, a piston-engined bomber dating from 1948, would be vulnerable to jet interception, especially during daylight hours.*

Defensive Capability

17. About three-fourths of its aircraft are fighters. The C.C.A.F./C.C.N.A.F. air defence capability is restricted by the lack of more modern types of aircraft, and by the fact that less than 10% of the fighters have an all-weather intercept capability. A comprehensive and relatively effective radar network, as shown at Appendix C, exists along the coast from Hainan in the south to the Soviet frontier. Inland there is partial coverage up to a depth of about 500 miles. Beyond that distance, cover is limited to the more important cities and industrial complexes. In addition, we believe that the Chinese have a limited early warning capability along the Sino/Indian border.

* See Appendix B for operating characteristics of bombers.

18. Despite the deficiencies listed above, as well as weaknesses in pilot proficiency and fighter tactics, in China proper the C.C.A.F./C.C.N.A.F. would have a good chance of intercepting intruding aircraft during daylight hours in clear visibility. In the Himalayan area China's air defence capabilities are at present limited because of inadequate radar coverage and the apparent absence of any jet fighter aircraft. The Chinese may have a very limited ground control intercept capability from bases in Tibet, but we have no firm evidence of this.

19. Within China proper we have evidence of a small number of surface-to-air missile sites at Peiping and at two other locations in the north and west. Moreover, China has a well co-ordinated conventional anti-aircraft artillery defence system in her coastal provinces. Inland, however, the scale of defence decreases rapidly and only the more important cities are known to have reasonable A.A. cover.

Air Transport Capabilities

20. The operating capability of the air transport force is low by Western standards; aircrews are not highly trained, payloads are small, serviceability is generally low, and navigational facilities in China are poor.

21. Nevertheless, air transport plays an important part in Chinese defence plans. The main task is to provide logistic and tactical support for all Armed Forces. China's air transport facilities are inadequate to cope with vast distances of the country which are poorly served by ground transport systems. There is a small civil air fleet which is regularly used for carrying freight, and conversion to military use of a small part of this fleet could quickly be effected.

22. The Chinese Communists have only a limited capability for airborne operations. Any large-scale diversion of civil aircraft would probably cause a major disruption of essential civil air transport operations. The Chinese are also severely handicapped by a lack of aircrews trained for airborne operations, and by lack of suitable transport aircraft with a "heavy drop" capability. Nevertheless, in favourable circumstances a limited operation might be undertaken. Supply dropping could also be carried out.

AIR OPERATIONS AGAINST INDIA

23. Communist China is extremely sensitive to the possibility of an attack by Nationalist China in the present period of economic difficulties, but we do not believe the resulting desire to maintain a strong air posture in China would seriously handicap Communist

China's ability to wage a limited air campaign against India. Even so, it is unlikely that the Chinese Communists could deploy and logistically support more than 290 tactical aircraft for operations against India (i.e. 180 jet fighters, 50 jet light bombers, and 60 piston light bombers).

Logistics

24. The key to tactical air operations against India would be the amount of logistic support, particularly P.O.L., which the Chinese could provide to forward bases. We have no evidence of stockpiling in the area. Because of Army demands the amount of logistic support that could be made available to the air force would be limited. Furthermore, because of the extent to which civil and military air transport is stretched, the numbers on such aircraft that could be made available for air supply operations in the area would also be limited. The overall ground and air logistic capability is set out at Appendix "E". However, we emphasise that the figures are theoretical and that the actual implementation of such a logistic operation is likely to impose severe organisational, climatic and operating problems.

25. If all the available military and civil transport aircraft which could be supported logistically from bases close to railheads

in China were to be used, they could sustain a daily average of about 130 tons. However, if as we think, the Chinese wish to avoid disruption of essential civilian and military air transport services, we consider that only about 40 aircraft would be made available. These could uplift 47 tons daily for a sustained period from railheads in China. This amount, together with a logistic effort of up to 450 tons that could be made available from ground throughput (see Appendix "E") totals some 500 tons daily. Assuming a serviceability rate of about 60% this theoretical capacity would permit a possible tactical application of about 150 sorties per day which could be allocated to operational sorties as follows:-

(a) 15 jet light bomber sorties.

(b) 35 piston light bomber sorties.

(c) 40 jet fighter sorties.

(d) 60 jet ground attack sorties.

26. If air operations were to be supported only by air transport supply the uplift of 47 tons would allow the following alternative operations:-

(a) 4 - 5 jet light bomber sorties (each at 3 short tons per flying hour for 3.3 hours), or

(b) 12 - 14 piston light bomber sorties (each at 1 short ton per flying hour for 3.6 hours), or

(c) 11 - 16 jet fighter sorties (each at 1 1/2 short tons per flying hour for 1.6 to 2.1 hours), or

(d) 26 - 29 jet ground attack sorties (each at 2 short tons per flying hour for 0.8 to 0.9 hours).

27. The mounting of ground logistic operations of the magnitude described in paragraph 24 above, in the difficult terrain and climate conditions that obtain calls for a very high degree of organisational, technical and operational competence. Additionally, some 7,000 vehicles would be required. Furthermore, the length of lines of communications and the restricted nature of the bases are factors which mitigate against logistic operations of this magnitude. Considering the practical limitations, therefore, the possibility of an increase in logistic support being made available from ground resources must be treated with caution.

Offensive Operations

28. The Communist Chinese bomber force is presently deployed primarily in northern China proper, none of it being located in Tibet or Sinkiang. In time past, limited numbers of BATs, BEAGLEs and BULLs have operated in Tibet from KA-EHR-MU (Golmo).

29. Despite the recent fighting, there is no evidence of light bomber deployment into South-West China or the Tibetan area. However, if China chose to deploy into these areas a few jet light bombers, operating from Lhasa, they could carry out tactical attacks in the NEFA area. BEAGLEs, operating from Kunming or Chengtu could also cover most of the NEFA area. Tactical operations against the Ladakh/ Jammu/Kashmir area could be mounted from Chinese bases at Hotien (Khotan) and Soche (Yarkand). The piston-engined BAT would be suitable for operations in both areas, and in comparison with jet aircraft, would probably give a higher rate of serviceability. However, it would be most vulnerable to jet interception. Under present circumstances the Chinese could only provide very limited close support with ground attack aircraft for their troops; in some areas terrain would limit the effectiveness of such attacks.

30. By day, in a strategic role, BEAGLEs could operate against cities in northern India, such as Delhi, from Soche (Yarkand). They could bomb targets in the NEFA area and north-eastern India from LHASA, CHENGTU and KUNMING BEAGLE aircraft, with a reduced bomb load, could bomb CALCUTTA from LHASA. By night, because of difficulties of operating from Tibetan airfields, we do not consider it likely that the Chinese would attempt such operations with the

BEAGLE aircraft. However, we believe that the light bomber force is probably capable of night operations and that a few sporadic raids could be mounted. The BULL and the BADGER, with combat radii of 1,700 nautical miles, could cover northern and north-eastern India from their base in Sian.* They could, if they chose, deploy to suitable bases nearer India. We doubt that more than four to six BULLs could be launched in an attack, but these aircraft would not have long-range fighter protection and would be vulnerable to jet interception if detected.

Defensive Operations

31. It is reasonable to assume that the continuing expansion of radar facilities in China has by now resulted in some equipment being sited in the north-western frontier area and, if such is the case, a limited air defence radar capability exists along the entire Himalayan frontier. It would be possible to operate a few fighters in the air defence role in Tibet although our evidence does not suggest that fighters are currently deployed there. Such aircraft would encounter difficult operating conditions, and terrain would limit radar effectiveness.

* See Appendix B for operating characteristics of bombers and Appendix C for aircraft radii of action.

Airborne and Air Supply Operations

32. In view of the limitations of and other calls upon the transport force, extensive airborne operations are unlikely. The air situation, however, would not necessarily be unfavourable to the Chinese in all areas where they might contemplate limited airborne operations. There is some evidence that limited supply dropping has been carried out.

CONCLUSIONS

33. Although the Communist Chinese Air Forces are numerically large, most of the aircraft are obsolescent, few have an all-weather capability, they lack advanced weapons such as air-to-air missiles, and pilot combat proficiency is only fair. Moreover, China is unlikely to obtain more than a few modern combat aircraft in the next few years, either from its own industry or from the Soviet Union.

34. The Chinese could deploy and support approximately 290 tactical aircraft for operations against India without seriously weakening their defence posture toward Taiwan. However, China's ability to wage a tactical air campaign against India would be seriously handicapped by difficulties in the provision of logistic support. The scarcity of suitable airfields in Tibet and Sinkiang would constitute an added hindrance.

35. The Chinese could mount only light, sporadic raids against India with piston bombers (BATs and BULLs) and such aircraft, if detected, would be highly vulnerable. However, it is likely that limited numbers of Chinese BEAGLEs could be used against Indian targets in sustained operations.

36. Although Chinese air defences in the Himalayan frontier area generally are weak, we believe the Chinese Air Force provide some defence for a few localities along the frontier. The five airfields in the Sinkiang-Tibetan area most likely to be used in operations against India would be vulnerable to air attack. However, we do not believe that this alone would deter the Chinese from mounting operations from them.

37. We believe that the Chinese are capable of undertaking limited airborne operations, although this appears unlikely in present circumstances.

38. In sum, because of the general weaknesses of the C.C.A.F./ C.C.N.A.F. in equipment and combat proficiency, the very formidable difficulties of maintaining logistic support over extended lines of communications, and the problem of mounting operations from inadequate bases in the Himalayan area, we believe that Communist China poses only a limited air threat to India. For these and other reasons we believe that China would be most reluctant to initiate air operations, even tactical air operations, against India.

APPENDIX "A" - C.C.A.F./C.C.N.A.F. AIR ORDER OF BATTLE

C.C.A.F.

TYPE OF AIRCRAFT	ROLE	NO*	TOTAL
Fagot (MIG.15)	Fighter (Day)	690	
Farmer (MIG.19)	Fighter (Day)	60	
Fresco (MIG.17)	Fighter (Day)	785	
Fresco D (MIG.17D)	Fighter (Day)	145	1,680
Beast (IL.10)	Ground Attack*	40	40
Bat (TU.2)	Light Bomber	100	
Beagle (IL.28)	Light Bomber	175	
Bull (TU.4)	Medium Bomber	15	290
C46/C47	Transport	30	
Cab	Transport	35	
Coach	Transport	35	
Colt	Transport	25	
Coot	Transport	2	
Crate	Transport	45	172
TOTAL			2,182

C.C.N.A.F

Fagot	Fighter (Day)	170	
Fresco	Fighter (Day)	70	
Fresco D	Fighter (Day)	30	270
Bat	Light Bomber	5	
Beagle	Light Bomber	150	155

C.C.N.A.F. (Con't)

TYPE OF AIRCRAFT	ROLE	NO*	TOTAL
Cab	Transport	15	
Colt	Transport	5	
Crate	Transport	5	25
Madge	Reconnaissance	10	10
TOTAL			460

* Figures rounded to nearest five.

ø Fresco D has a limited all-weather capability.

* In addition, a unit of 30 MIG.15 (FAGOTS) is specially trained in ground attack and, in fact, all FAGOT/FRESCOs are readily adaptable to ground attack.

APPENDIX "B"

TABLE 1

Performance of C.C.A.F./C.C.N.A.F. Aircraft

FIGHTERS

(INTERCEPT MISSION)

Basic Performance Data									Area Intercept Sortie Description	Combat Radius		Weapon System		Electronics
Aircraft and Engines	Fuel Weight Int. lb.	Ext. lb.	Total lb.	AUW lb.	Time to Ht. (Mil power) mins. ft.	100 ft./min ceiling (1.5G)	Speed at Ref. Ht. Max Kts.	Cruise Kts.		With Int. Fuel Only n.mls	Plus Ext. Fuel n.mls.	Weapons	Fire Control	
FAGOT (MIG.15) One VK-1 engine 5,940 lb SLST centifugal flow turbo-jet	2,500	Nil	2,500	11,000	7.6/40,000 14.4/50,000	52,700 (44,700)	--	475/50,800	High level out and back with 5 minutes combat clean.	330	--	Guns:- 1x37mm 2x23mm	Lead computing gyro gunsight with manual ranging	VHF- (4 channel) IFF - Marker Beacon Receiver Radio Compass- Radio Altimeter-
	2,500	900	3,400	12,000	8.3/40,000	52,000	505/50,000) 583/SL) 530/36,000)	475/49,450	With 2 x 450 lb tanks		495			
	2,500	1,400	3,900	12,600	9.7/40,000 13.5/45,000	51,500 (43,500)	--	475/48,600	With 2 x 700 lb drop tank	--	570			

(Table 1 con't)

APPENDIX "B"

Aircraft and Engines	Basic Performance Data: Fuel Weight Int. lb.	Fuel Weight Ext. lb.	Fuel Weight Total lb.	AUW lb.	Time to Ht. (Mil power) mins. ft.	100 ft./min ceiling (1.5G)	Speed at Ref. Ht. Max Kts.	Speed at Ref. Ht. Cruise Kts.	Area Intercept Sortie Description	Combat Radius Weapon System: With Int. Fuel Only n.mls.	Plus Ext. Fuel n.mls.	Weapons	Fire Control	Electronics
FRESCO A&B (MIG 17) One VK1 engine 5,940 lb SLST Centrifugal flow turbojet	2,500		2,500	11,600	8.3/40,000 13.4/50,000	54,000 (46,000)	570/SL 550/36,000	505/50,000	High level out and back with 5 minutes combat with 2 x 700 lb tanks	300	--	FRESCO A&B Guns:- 1x37mm, 2x23mm.	FRESCO A&B Lead computing Gyro gunsight with gun ranging radar.	FRESCO A&B,C&D VHF (6 channel) IFF Passive Tail Warner, Marker Beacon Receiver Radio Compass Radio Altimeter
	2,500	1,400	3,900	13,200	11.6/40,000 27.6/50,000	54,000 (46,000)	535/50,000 570/SL 556/36,000 535/20,000	505/50,000			540			
FRESCO C&D (MIG 17) One VK-1F engine 5,730 lbs SLST centrifugal flow turbojet reheated to 7,450 lb.	2,500		2,500	11,800	8.5/40,000 13.8/50,000	55,000 (47,000)	570/SL 560/36,000 550/50,000	505/50,000	High level out and back with 5 minutes combat.	270	--	FRESCO C&D Guns:- 3x23mm	FRESCO C Lead computing gyro gunsight with gun ranging radar. FRESCO D Lead computing gyro gunsight with AI radar. Search/track ranges 6/2nm Suitable for stern chase only	
	2,500	1,400	3,900	13,400	11.8/40,000 25.5/50,000	555,000 (47,000)	570/SL 560/36,000 550/50,000	505/50,000	With 2 x 700 lb tanks		510			

[redacted]

(Table 1 con't)

APPENDIX "B"

Aircraft and Engines	Basic Performance Data: Fuel Weight Int. lb.	Fuel Weight Ext. lbs.	Fuel Weight Total lb.	AUW lb.	Time to Ht. (Mil power) mins. ft.	100 ft./min ceiling (1.5G)	Speed at Ref. Ht. Max Kts.	Speed at Ref. Ht. Cruise Kts.	Area Intercept Sortie Description	Combat Radius Weapon System: With Int. Fuel Only n.mls.	Plus Ext. Fuel n.mls.	Weapons	Fire Control	Electronics
FARMER (MIG 19) Two RD9B Engines 5,730 lb SLST axial flow turbo-jets reheated to 7,170 lb.	3,950		3,950	17,000	5.0/40,000 12.0/50,000	56,000 (48,000)	660/SL 760/36,000 640/50,000	520/45,000	High level out and back with 5 minutes combat	300	--	Guns:- FARMER A 1x37mm 2x23mm FARMER B & C 2x30mm FARMER D 3x30mm	FARMER A, C&D -- Lead computing gyro gunsight with gun ranging radar. FARMER B Lead computing gyro gunsight with A.I. radar. Search/track ranges 8/3nm Suitable for stern chase only	VHF - (6 channel) IFF Passive Tail Warner Radio Compass - Marker Beacon Receiver Radio Altimeter.
	3,950	2,200	6,150	19,500	7.2/40,000 17.0/46,000	55,000 (47,000)	660/SL 760/36,000 630/50,000	510/42,000	With 2 x 1,100 lb tanks	--	520			

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APPENDIX "B"

TABLE 2

Performance of C.C.A.F./C.C.N.A.F. Aircraft

GROUND ATTACK

Aircraft and Engines	Fuel Weight				Maximum Knots at Height	Sortie Description	Combat Radius		Weapons	Fire Control	Electronics
	Internal lb.	External lb.	Total lb.	All-up Weight lb.			Internal Fuel Only (n.mls.)	Plus External Fuel(n.mls.)			
BEAST (IL.10) One AM-42 1,975 EHP	1,160	--	1,160	14,500	270 at 5,000	Basic ground attack mission	170	--	Fixed forward 2 - 23mm and 2 x 7.62mm. Flexible rear 1 x 12.7mm. Normal bomb load 880 lb Max. bomb-load 1320 lbs or 6 x 132mm unguided air-to-air rockets.	Optical gyro gun sight	VHF RT I.F.F. and Radio Compass
FAGOT (MiG 15) One VK1 5940 lb	2,500	--	2,500	12,100	574/S.L.	Standard Mission* with 2 x 550 lb bombs, no external fuel.	125		As for Area Intercept Mission		
	2,500	700	3,200	12,900	574/S.L.	Standard Mission* with 1x 550 lb bomb and 1 x 700 lb external fuel tank.		200			
SLST Centrifugal flow turbojet											
FRESCO A,B,&C (MiG 17)	2,500	--	2,500	12,600	570/S.L.	Standard Mission* with 2 x 550 lb bombs, no external fuel.	60		As for Area Interception Mission		
	2,500	700	3,200	13,500	570/S.L.	Standard Mission* with 1x 1100 lb bomb and 1 x 700 lb external fuel tank.		180			

(Table 2 cont'd)

[redacted]

APPENDIX "B"

Aircraft and Engines	Fuel Weight				Maximum Knots at Height	Sortie Description	Combat Radius		Weapons	Fire Control	Electronics
	Internal lb.	External lb.	Total lb.	All-up Weight lb.			Internal Fuel Only (n.mls.)	Plus External Fuel(n.mls.)			
FARMER A,C,&D	3,950	2,200	6,150	20,300	570/S.L.	Standard Mission* with two rockets and 2 x 1100 lb external tanks.		430	As for Area Intercept Mission		
	3,950	2,200	6,150	21,100	570/S.L.	Standard Mission* with two 550 lb bombs and 1100 lb external fuel tanks.		375			

* STANDARD MISSION = Take-off and acceleration to best climb speed for two minutes at normal rated power, climb at military power to cruise altitude, cruise to target at speeds for maximum range, descend to sea level, combat five minutes at military power, climb on return course at military power, cruise back to base at speeds for maximum range, with reserve fuel for ten minutes loiter at sea level at maximum endurance.

[redacted]

TABLE 3

APPENDIX "B"

BOMBER AIRCRAFT
High Level Bombing Missions

Aircraft and Engines	Fuel Weight (lbs.)	Bomb Weight (lbs.)	All-up Weight (lbs.)	Target Altitude (ft.)	Speed at Target Alt. Maximum (Kts.)	Speed at Target Alt. Cruise (Kts.)	Combat Radius (N.M.)	Guns	Fire Control	Bombing System	Electronics
BAT(TU-2) Two ASH-82 FNV 1825 HP Air cooled radial engines.	4300	3300	24500	10000	260	180	440	2 x 20mm guns in wing roots. 1 x 12.7mm flexible gun in rear cockpit, upper and lower gun positions.	Optical gun-sight	Optical bomb-sight	V.H.F. Radio compass I.F.F.
BULL(TU-4) Four ASH-90 2200 BHP Air cooled radials.	36500	20000**	140000	30000	350	200	1300	Barbettes (Upper forward (Lower forward (Upper aft (Lower aft Tail turret All mount 2 x 23mm guns.	Central fire control system for upper and lower barbettes. Tail turret may be locked into the system.	Norden type optical bombsight. Radar bombing also possible.	V.H.F. H.F.(W/T) Radio compass Radio altimeter Marker beacon receiver ILS Bomb/Nav radar
	46500	10000	140000	30000	350	200	1750				
BEAGLE(IL-28) Two VK-1 5940 lb. SLST centrifugal turbojets.	14500	6600	51000	34500	425	380	600	Fixed forward nose guns 2 x 23 mm Tail turret 2 x 23mm guns.	Optical lead computing gyro gunsights.	Norden type bombsight with electro mechanical computer for coordinating optical radar bombing.	V.H.F. H.F. (W/T) Radio compass Radio altimeter Marker beacon receiver ILS Bomb/Nav.radar Gun ranging/ tail warning radar.
	14500	4400	48800	35500	430	380	610				
	14500	2200	46600	36500	435	380	620				
	8400	2200	40500	39000	445	380	400				

APPENDIX "B"

(Table 3 cont'd)

Aircraft and Engines	Fuel Weight (lbs.)	Bomb Weight (lbs.)	All-up Weight (lbs.)	Target Altitude (ft.)	Speed at Target Alt. Maximum (Kts.)	Speed at Target Alt. Cruise (Kts.)	Combat Radius (N.M.)	Guns	Fire Control	Bombing System	Electronics
BADGER (TU-16) Two RD-3M 20900 lb. SLST axial flow turbojets	75500	10000*	170000	40800	490	465	1700	Fixed nose gun 1 x 23mm Tail, dorsal and ventral turrets each mount 2 x 23 mm guns.	Optical gyro gunsight for pilot. Turrets:-Remote optical computing pedestal sights with radar ranging in tail turret. Probable central fire control system.	Nordan type optical bombsight with electro-mechanical computer for co-ordinating optical radar bombing.	V.H.F.,H.F. (W/T),I.F.F. Radio compass Radio altimeter Marker beacon receiver ILS Gun ranging/ tail warning radar. Bomb/Nav.radar type

* BADGER can carry a maximum bomb load of 22,000 lbs to a reduced radius of 1300 n.m.

** BULL could operate from Lhasa at an AUW of 120,000 lbs. including 5000 lbs of bombs to a radius of about 1200 n.m.

APPENDIX "B"

TABLE 4

TRANSPORTS

CONSTANT CRUISE ALTITUDE MISSIONS

Aircraft and Engines	Fuel Weight lb.	Freight lb.	Passengers Number	All-up Weight lb.	Cruising Altitude	Speed at Cruise Alt. Max. Kts.	Speed at Cruise Alt. Cruise Kts.	Range n.mls.	Weapons	Fire Control	Electronics
CAB (IL.2) Two ASH-62 IR 985 BHP Air cooled radial engines	4,900 1,600	3,300 6,600	or 20 --	25,300 25,300	10,000 SL	165 165	130 120	1,175 345	--	--	4 Channel VHF HF(W/T) IFF Radio Compass, Radio Altimeter
COACH (IL.12) Two ASH-82FN 1,825 BHP Air cooled radial engines	6,500 2,500	3,500 7,500	or 18	36,500 36,500	10,000 5,000	220 220	160 160	1,335 490	--	--	4 Channel VHF, HF(W/T) IFF Radio Compass Radio Altimeter
CRATE (IL.14) Two ASH.82 R 1,900 BHP Air Cooled radial engines	5,500 1,600	4,600 8,500	or 18 --	36,000 36,000	10,000 SL	230 230	165 165	1,400 400	--	--	4 Channel VHF, HF(W/T) IFF ILS, Radio Compass Radio Altimeter, Marker beacon receiver.
COOT (IL.18) Four AL-20 4,000 ESHP Turbo-prop engines	40,200 31,200	22,000 31,000	or 75 Note:- COOT can carry up to 111 passengers.	134,000 134,000	25,000 25,000	390 390	320 320	2,500 1,600	--	--	2 x 20 Channel VHF; 2 x Radio compass HF(W/T) Radio altimeters IFF, ILS, Nav Radar Marker Beacon Receiver

APPENDIX "B"

(Table 4 con't)

Aircraft and Engines	Fuel Weight lb.	Freight lb.	Passenger Number	All-up Weight lb.	Cruising Altitude	Speed at Cruise Alt. Max. Kts.	Speed at Cruise Alt. Cruise Kts.	Range n.mls.	Weapons	Fire Control	Electronics
COLT (AN.2) ASH.62 985 BHP Air cooled radial engine.	1,100	2,700	or 12	11,550	6,500	150	110	485	--	--	VHF, HF Radio Compass Marker Beacon Radio Altimeter.
	2,150	1,650	or 7	11,550	6,500	150	110	950			

APPENDIX "B"

TABLE 5

BEAGLE

ESTIMATED TAKE OFF REQUIREMENTS AT VARIOUS ALTITUDES

STILL AIR CONDITIONS

A.U.W. 51,000 lbs

Ambient Temp.	Altitude			
	6,000 ft.	10,000 ft.	14,000 ft.	15,000 ft.
	TOR ft.	TOR ft.	TOR ft.	TOR ft.
15° C	8,200	11,100	14,800*	16,100*
0° C	6,850	9,500	13,200*	14,800*
-10° C	6,350	8,700	12,150*	12,950*
-20° C	5,800	7,650	11,100*	12,000*

A.U.W. 48,800 lbs

Ambient Temp.	Altitude			
	6,000 ft.	10,000 ft.	14,000 ft.	15,000 ft.
15° C	7,550	10,200	13,600*	14,800*
0° C	6,300	8,750	12,150*	13,600*
-10° C	5,850	8,000	11,150*	11,900*
-20° C	5,350	7,050	10,200	11,000*

A.U.W. 46,600 lbs

Ambient Temp.	Altitude			
	6,000 ft.	10,000 ft.	14,000 ft.	15,000 ft.
15° C	6,700	9,050	12,050*	13,100*
0° C	5,600	7,750	10,750*	12,050*
-10° C	5,200	7,100	9,900	10,550*
-20° C	4,750	6,250	9,050	9,750

NOTE 1:- * It is estimated that take-off in these cases would be prohibited by excessive tyre speed.

NOTE 2: At altitude 14,000-15,000 ft., for each 10 knots of headwind reduce T.O. Run by about 5%.

NOTE 3: At 6,000 ft. each 10 knots of headwind reduce T.O. Run by about 7%.

APPENDIX "D"

AIRFIELDS IN TIBET AND WESTERN CHINA

The following is a summary of airfields in China which might be used for operations against India.

39°31'N 75°58'E	KASHGAR/ZANG KARAVUL	4,000 feet Gravel. (4,000 feet a.m.s.l.)
37°09'N 79°52'E	HO-TIEN (KHOTAN)	5,000 feet (est. min.) Packed gravel (3,000 feet approximate a.m.s.l.)
38°25'N 77°17'E	SO-CHE (YARKAND)	8,000 feet estimated. (4,400 feet a.m.s.l.)
36°45'N 95°35'E	KA-EHR-MU (GOLMO)	8,000 feet crushed rock. (9,000 feet a.m.s.l.)
32°53'N 96°47'E	YA-SHU	8,000 feet claybound crushed rock. (12,525 feet a.m.s.l.)
30°30'N 91°06'E	LHASA	13,000 feet claybound crushed rock. (14,177 feet a.m.s.l.)
31°33'N 91°44'E	NAGCHHU DZONG	12,000 feet (est.). Claybound crushed rock. (15,000 feet a.m.s.l.)
30°43'N 103°57'E	CHENG-TU/WEN-CHIANG	7,500 feet concrete. (1,700 feet a.m.s.l.)
25°00'N 102°45'E	KUNMING	9,500 feet concrete. (6,220 feet a.m.s.l.)

2. Unconfirmed reports indicate the possibility that airfields may have been constructed at the following locations in Tibet: Rudog (33 27N, 79 42E); Tashigong (32 32N, 79 41E); Gartok (31 45N, 80 22E);

Zhikatse (29 17N, 88 54E); Gyangtse (28 57N, 89 38E); and Tsona Dzong (28 00N, 91 59E). No construction details are available; however, if the airfields are in existence, it is unlikely that they would be suitable for jet operations. Supporting facilities would probably be limited and the maintenance of P.O.L. supplies would be extremely difficult.

3. Reliable reports indicate that construction had probably begun near Tingri Dzong (28 25N, 86 38E) in 1959 but was abandoned in the initial stage. The area is a flat valley floor which is an excellent site for the construction of a large airfield.

APPENDIX "E"

THEORETICAL LOGISTIC CAPACITIES

Ground Forces

1. It is assumed that, taking into account probable climatic conditions, the overall tonnage that could be delivered daily by road from railheads in China would be in the order of 1,600 tons.

2. We estimate that the existing Chinese ground forces in Tibet, of strength of about 105,000, would require a daily tonnage of approximately 450 when fighting at an intensity of operations similar to those recently carried out. This estimate is based on the assumption that:-

(a) the Chinese will, if necessary, supplement existing transport from resources outside the area;

(b) there is no supply shortage along the routes concerned;

(c) the majority of the load carrying vehicles will be in the 3-ton range.

3. The basic requirement of 450 tons daily will need to be supplemented to meet requirements for:-

(a) the maintenance of P.O.L. stocks along the lines of communication;

(b) the build up of modest reserves for the forward area;

(c) essential civilian requirements;

(d) the move of special loads;

(e) the movement of road maintenance material;

(f) vehicle recovery.

4. The factors set out at paragraph 3(a) to (c) above are considered to require some 650 tons per day. Allowing for the remaining factors the overall total requirement for ground forces is likely to total, therefore, some 1,150 tons per day. Such calculations, however, mean that any reinforcement of the Chinese Army would have to be made before the operations started if the ground supply tonnage for air forces is not to be affected. Accordingly, providing the Army had no tactical reinforcement requirement, some 450 tons per day might be made available for the support of air forces.

Air Force

5. If all of the available military and civil transport aircraft which could be supported logistically from bases close to railheads in China were to be used, they could uplift a daily average

of about 130 tons. However, if as we think the Chinese wish to avoid disruption of essential civilian and military air transport services, we consider that only about 40 aircraft would be made available. These could uplift 47 tons daily for a sustained period from railheads in China.

6. This amount, together with the logistic effort that could be made available from ground throughput totals some 500 tons daily. Assuming a serviceability rate of 60% this theoretical capacity would permit a possible tactical application of about 150 sorties per day which could be allocated to operational sorties as follows:-

(a) 15 jet light bomber sorties.

(b) 35 piston light bomber sorties.

(c) 40 jet fighter sorties.

(d) 60 jet ground attack sorties.

7. There would be no such logistic limitations on medium bomber operations since operations would be carried out from bases close to railheads in China.

APPENDIX "E"

Appreciation of Theoretical Estimates

8. The mounting of air and ground logistic operations of this magnitude in the difficult terrain and climate conditions that obtain calls for a very high degree of organisational, technical and operational competence. Additionally, some 7,000 vehicles would be required. Furthermore, the length of lines of communications and the restricted nature of the bases are factors which mitigate against logistic operations of this magnitude. Considering the practical limitations, therefore, all of these theoretical calculations must be treated with the utmost caution.